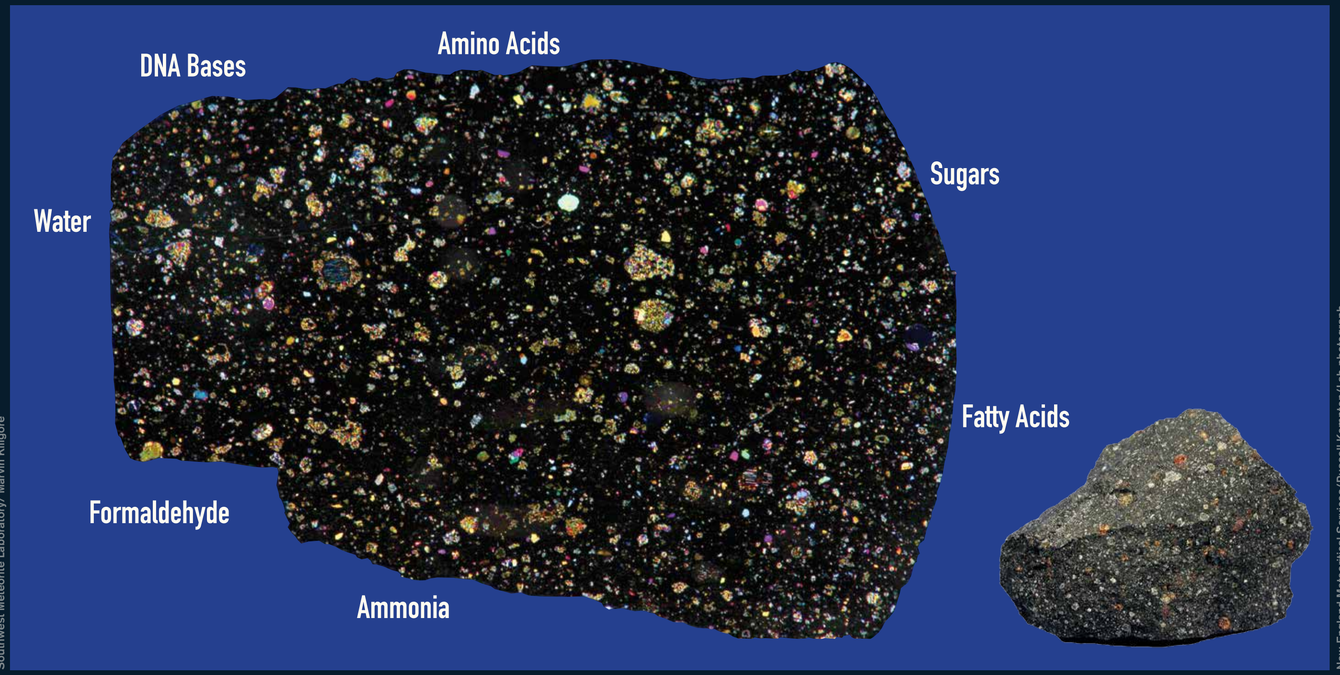
STATION 07 Meteorites Contain Ingredients for Life



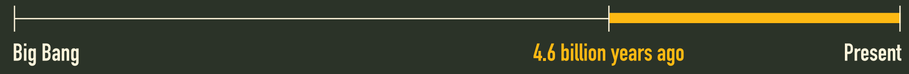
Southwest Meteorite Laboratory/ Marvin Kilgore

New England Meteoritical Services/Russell Kempton/Lab photograph

CARBONACEOUS METEORITES CONTAIN MANY ORGANIC CHEMICALS: The >100-kilogram (>220-pound) Murchison meteorite landed in Australia in 1969 and has been extensively studied. It contains many types of chemicals that are used by life on Earth. A pebble-sized fragment (less than an ounce or 23 grams) is shown at lower right. Magnified 10 times and seen in polarized light, a thin slice reveals colors that indicate different minerals.

Many meteorites are pieces of asteroids and comets that land on Earth. Others are rocks from Mars or the Moon. Some contain a variety of organic (carbon-containing) chemicals. These include amino acids (the building blocks of proteins) and nucleobases that form the rungs of the DNA ladder (life's genome). Astrobiologists study these meteorites to discover their chemical content.

BUILDING BLOCKS OF LIFE
The amino acid glycine, made of carbon (gray), nitrogen (blue), oxygen (red), and hydrogen (white), is one of the many chemicals essential to life on Earth that are also present in meteorites.



Finding Meteorites on Earth

NASA Ames/Scott Sanford

COLLECTING EXTRATERRESTRIAL VISITORS: The yearly Antarctic Search for Meteorites (ANSMET) expedition finds and collects meteorites for scientific study.

About 40,000 tons of meteoritic material hit Earth each year. Most of it is dust that burns up in the atmosphere, but larger pieces land all over Earth's surface. Scientists study collected meteorites, often by crushing them and placing them in hot water to dissolve certain molecules. The resulting "meteorite tea" is analyzed in the laboratory to identify the meteorite's chemical content.